

CLAIMS

1. A reader interfacing device (120) for providing a communication path between:

- (a) a reader (20) configured to emit and receive interrogating radiation at a first radiation frequency; and
- (b) a remote tag or smart label (110) configured to be interrogated using radiation of a second frequency,

the first and second frequencies being mutually different by at least an order of magnitude, and the reader being operable to communicate through the device to the remote tag or smart label.

2. A device according to Claim 1 including power conversion means for converting interrogating radiation received at the device from the reader to generate power supply potentials for powering the device.

3. A device according to Claim 1 or 2 wherein the device is mutually magnetically coupled to the reader for receiving the interrogating radiation therefrom and for providing a modulated load thereto for communicating back to the reader.

4. A device according to Claim 3 wherein the device includes a first loop antenna for magnetically coupling to a corresponding second loop antenna of the reader.

5. A device according to Claim 4 wherein the device incorporates a modulated field effect transistor connected to the first loop antenna for providing a variable load detectable at the reader.

6. A device according to any one of Claims 1 to 5 wherein the second frequency is in a range of 300 MHz to 90 GHz.
7. A device according to Claim 6 wherein the device is configured to emit radiation to the remote tag or smart label and receive radiation therefrom using patch antennae.
8. A device according to Claim 6 or 7 wherein the second frequency is substantially in a range of 2 GHz to 3 GHz.
9. A device according to any one of Claims 1 to 8 including translating means for converting between a modulation format used by the reader for modulating information onto the interrogating radiation to be received by the device and a modulation format used by the remote tag or smart label for communicating therefrom to and from the device.
10. A device according to Claim 9 wherein the translating means includes an amplitude demodulator for demodulating a first received signal generated in the device in response to receiving thereat the interrogating radiation from the reader and thereby generating a first demodulated signal, the translating means further including a modulator supplied with a carrier signal at the second frequency and operable to modulate the carrier signal with the first demodulated signal to generate radiation for interrogating the remote tag or smart label.

11. A device according to Claim 9 or 10 wherein the translating means includes a demodulator for heterodyne mixing a second received signal generated in response to receiving radiation from the remote tag or smart label with the carrier signal to generate a second demodulated signal for use in providing load modulation detectable at the reader.
12. A device according to Claim 11 wherein the carrier signal is generated by a microwave oscillator frequency locked to the first frequency.
13. A remote tag or smart label for use with the device according to any preceding claim, the remote tag or smart label incorporating amplifying means for reflectively amplifying a received signal generated therein in response to receiving interrogating radiation from the device, the amplified received signal useable for providing response radiation receivable at the device.
14. A device according to Claim 1 wherein the reader (20) includes optical interfacing means for providing the communication path between the reader (20) and the device (120).
15. A device according to Claim 14 wherein the interfacing means includes a laser scanner and a liquid crystal display, the scanner operable to scan information presented on the display to provide information exchange between the reader (20) and the device (120).

16. A device according to Claim 1 including optical interfacing means for providing the communication path between the device (20) and the remote tag or smart label.